U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-253 327

BASIC DATA AND ANALYSES: SELECTED ASPECTS OF GREAT LAKES ENFORCEMENT

ENVIRO CONTROL, INCORPORATED

PREPARED FOR
ENVIRONMENTAL PROTECTION AGENCY

DECEMBER 1971

161124

PB 253 327

BASIC DATA AND ANALYSES: SELECTED ASPECTS OF GREAT LAKES ENFORCEMENT

Contract # 68-04-0018

Submitted to:

Environmental Protection Agency
Washington, D. C.

Submitted by:

Enviro Control, Inc.
1250 Connecticut Avenue, N. W.
Washington, D. C. 20036

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

December 1971

76

TABLE OF CONTENTS

		Page
I.	INTRODUCTION AND SUMMARY	1
II.	SAMPLE OF INDUSTRIES UNDER ENFORCEMENT	2
	1. Data Collected	2
	2. Categorization	2
	3. Enforcement Profile Analysis	10
III.	LEGAL TOOLS	36
	APPENDIX I - SAMPLE OF INDUSTRIAL DISCHARGERS UNDER ENFORCEMENT	

I. INTRODUCTION AND SUMMARY

The current study represents the results of an intensive three-week effort to analyze the legal basis for and the historical impact of enforcement in the Great Lakes area. A file of characteristics of 343 dischargers under enforcement proceedings was assembled and a preliminary characterization in terms of pollutional problems, enforcement mechanisms used, compliance status (with emphasis on actual construction) and detectable economic impact was prepared. Findings relating to differences among States and relative impact of State and Federal programs are included.

In addition, a thorough review of the legal tools available to State and Federal enforcement personnel was conducted, emphasizing the causes of differences in results among States and comparative legal activity demonstrated by the State and Federal programs. Additional emphasis is placed on legislation and judicial precedent available prior to the environmental legislation of the sixties.

It is necessary to emphasize that the data sources for the basic discharger files are occasionally imprecise and inconsistent; considerably more validation and checking against primary sources are warranted. Similarly, the analysis is preliminary and by no means exhausts the possibilities of the data collected.

II. SAMPLE OF INDUSTRIES UNDER ENFORCEMENT

1. Data Collected

The basic data desired for an analysis of enforcement effectiveness and its economic impact on industry is a reasonably extensive sample of industrial dischargers subject to enforcement, accompanied by suitable descriptors. The descriptors chosen for the discharge sample are shown in Table I. The sample area chosen consisted of the U.S. drainage basins of Lake Erie, Lake Michigan and Lake Superior; this area was chosen for several reasons:

a. Current EPA interest in accelerated Great Lakes pollution abatement;

b. Relatively intensive Enforcement Conference effort throughout the area for at least six years.

c. A sample of States involved covering a wide range of enforcement stringency.

Actual sources used for constructing the industrial discharger file are listed in Table II. It is to be noted that these sources are not entirely consistent; consequently, establishing the discharger file required a considerable amount of cross-checking as well as judgment. The actual file with descriptions of 343 dischargers is presented in Appendix I.

2. Categorization

The final choice of descriptive items (conditioned heavily by data availability) for each discharger is as follows:

a. Name

TABLE II - DATA SOURCES FOR DISCHARGER FILE

Documents

Water Quality in The Calumet Area; TCWQ	Sept., 1970
Hammond Atlases	1965, 1966
Lake Erie Report; FWPCA	Aug., 1968
Testimony to Illinois PCB by Roy Weston	Oct., 1971
Pollution of Lake Erie..... etc.; IJC	1969
Pollution of Lake Michigan..... etc.; FWPCA	1968
An Appraisal of..... Lake Superior basin; FWPCA	1970
Thomas Register of American Manufacturers'	1968
Lake Michigan Conference; Sessions 1-3	1968-71
Lake Erie Conference; Sessions 1-5	1965-70
Lake Superior Conference; Sessions 1-2	1969-71
Detroit River Conference; Sessions 1-2	1962-65
Calumet River Conference; Sessions 1-2	1965-69
Status of Compliance Reports; Detroit, Calumet, Erie, Michigan, Superior	mid-1971
Standard Industrial Classification Manual	1967
D&B Plants by Product Classification	1968-69
Permit Applications under 1899 Refuse Act, Region V	1971
Summary Data on Enforcement Conferences	May, 1971

TABLE II - DATA SOURCES FOR DISCHARGER FILE
(continued)

People

Stein's office

Rajda
Berman
Mrs. Tacey

Region V

Mayo
McDonald
Kee
Dzikowski
Pratt
Buckley
Clemons

Michigan State District Office

O'Leary

b. Location - Town, county, state, drainage basin, receiving water.

c. Economic activity - SIC number, principal product names, number of employees.[1]

d. Water discharge volume (mgd).

e. Principal pollutant loads (annual average lbs/day) - "before" enforcement [2].

f. Principal pollutant loads (annual average lbs/day) - "after" enforcement [3].

g. Identified pollutional problems.

h. Type of enforcement action used.

i. Compliance status.

j. Permit application status.

k. Economic impact of enforcement (where known).

For items g,h and i, a detailed classification scheme is necessary. Fitting individual dischargers into these categories is by no means automatic, given the state of the source materials - in actual execution, the categorization task required substantial judgment by experienced personnel. Table III shows the categories of pollutional problems used; it is important to note that only in rare cases have the enforcement personnel diagnosing

---

[1] Remains to be completed from EPA D&B tape

[2] Taken nominally as discharge at the time of the first Enforcement Conference.

[3] Either after cleanup action is taken or at time of permit application (June-Oct., 1971), whichever is available.

TABLE III - CATEGORIES OF POLLUTION PROBLEMS

AC - Acid

CL - Chloride

CN - Cyanide

ME - Metals generally; if specific, as follows -

CU - Copper	ZN - Zinc
FE - Iron	PB - Lead
CD - Cadmium	HG - Mercury
CR - Chromium	AS - Arsenic
NI - Nickel	

AM - "Nutrient" nitrogen, as ammonia, etc.

OI - Oil

BO - BOD

PN - Phenols

SS - Solids, soluble

ST - Solids, total or unspecified

TO - Threshold odor

CO - Color

TH - Thermal

FL - Fluoride

individual discharger problems achieved any completeness of problem description. Many dischargers are simply described as "requiring advanced waste treatment" or "requiring municipal sewer connection". Even in cases where specific chemicals are cited, it is clear that complete analyses of heavy metals, salts, etc. are not normally available.

Table IV gives the definition of enforcement categories. The various legal action categories are normally quite specific (though the law used as basis for prosecution is rarely cited in the source materials). Unfortunately, for dischargers subject to Enforcement Conference or State jurisdiction, the source materials are not always explicit. Where a discharger is under an implementation schedule with no other known action, the IMPL code is used. If, in addition, he is under a specific State pollution board (or equivalent body) order, the ORDS code is used. Where a stipulation is known to be in effect, the STP(X) code together with years of schedule slippage is given, although it is rarely possible to tell whether the stipulation was concurred in by EPA. Table V gives the categorization of the compliance status for dischargers. In order to describe the amount of progress made (as well as schedule slippage and time to complete), a fairly detailed set of categories is given.

TABLE IV - DEFINITION OF ENFORCEMENT CATEGORIES

IMPL - Implemented; i. e., within scope of Enforcement Conference or other unspecified authority.

FCTRR - Federal Court action Recommended, under Refuse Act
FCTRW - Federal Court action Recommended, under FWPC Act
FCTRU - Federal Court action Recommended, under Unknown authority

FCTNR - Federal Court action, Now in progress; Refuse Act
W, U - FWPC Act, or Unknown authority

FCTWR - Federal Court action Won; Refuse Act
W, U - FWPC Act, or Unknown authority

FCTLR - Federal Court action Lost; Refuse Act
W, U - FWPC Act, or Unknown authority

SCTRR - Similarly, for State Court action

MCTRR - Similarly, for Municipal Court action

STPV(X) - Stipulation, voluntary
STPC(X) - Stipulation, court enforced
STPU(X) - Stipulation, unilateral by State

ORDS(X) - State order, or equivalent
(X) - number of years slipped from original schedule

180F - 180 day notice, federal

TABLE V - DEFINITION OF COMPLIANCE CATEGORIES

COP(X) - Compliant, Planning or early construction
COC(Y) - Compliant, Construction complete and working OK
COU(X) - Compliant, Unclear detail
CON - Compliant, No construction required
(X) - Years to complete (yr of CO in Status report, minus 71)
(Y) - Years of slippage

NCP(X) - Non-Compliant, Planning or financing
NCC(X) - Non-Compliant, Construction date passed
NCU(X) - Non-Compliant, Unsatisfactory although Construction complete
NCS(X) - Non-Compliant; Substantial progress, however
NCX - Non-Compliant, Unknown status
NCO - Non-Compliant, Objection to Fed/State requirements
(X) - Years tc complete (if estimated)

For permit application status, a definite finding can be made only in the case of applications already received by EPA from the Corps of Engineers or in cases where it is known that no permit is required, e.g., no discharge or discharge only to municipal systems. There is a large class of dischargers where it is not known whether applications have been submitted to the Corps. Where the application has been received but has unusable discharge data or no Part B (detailed discharge description), this fact is noted under the after-enforcement pollutant load description.

Finally, the only type of economic impact definable from the data available is plant closing or moving, which is given by the CLO and MOV codes. A separate file of such plants is presented in II-3 together with the causes of the move or closure where known.

3. Enforcement Profile Analysis

A preliminary analysis to characterize the 343 dischargers and their enforcement history has been accomplished with the data available. It is envisioned that considerably more detailed analysis will be accomplished using the same sample, backed up by further data collection, particularly from State sources.

The dischargers identified to date encompass those within the purview of any one of the enforcement conferences on Lake Erie, Lake Michigan or Lake Superior. It is not believed that this is a complete sample of all major dischargers on the three Lakes, though a substantial majority is probably included (a geographical cross-check with the D&B tape for completeness in at least steel, petroleum refining, paper and pulp, and food processing is envisioned). The distribution of dischargers by State and Lake is shown in Table VI.

In analyzing the reported pollution problems and abatement needs of the dischargers, these identifications must be viewed as a relatively incomplete characterization of the discharges involved. The numbers will reflect not only the more detectable pollution problems existing but also the emphasis and interests of enforcement personnel. With this caveat in mind, the data shows the following:

a. Treatment (secondary or advanced) and/or municipal hook-up is the most frequent recommendation made (50% and 34% of cases, respectively).

b. Among the cases with specific pollutant problems identified, the most common problem is solids (36% of all discharges) with BOD half as frequently identified (18%). Oil is identified in 16% of cases and heavy metals in 14%, nutrients in 13%, acidity in 9%, and cyanides in 7% of cases.

TABLE VI - DISTRIBUTION OF THE DISCHARGER SAMPLE BY STATE AND BASIN - NUMBERS OF FACILITIES

	Lake Erie	Lake Michigan	Lake Superior	ACROSS LAKES
Illinois	X	29	X	29
Indiana	23	45	X	68
Michigan	23	5	2	31
Minnesota	X	X	15	15
New York	25	X	X	25
Ohio	97	X	X	97
Pennsylvania	21	X	X	21
Wisconsin	X	39	19	58
ACROSS STATES	189	118	36	343

c. Chlorides, ammonia, phenols, odor and color problems are identified in no more than a few percent of cases (0-4%). Given the seriousness of the chloride problem for Lake Erie and the prevalence of the remaining problems in heavy industry, it seems likely that these areas are being underemphasized in enforcement. Nutrients receive relatively heavy emphasis on Lake Erie (19%) but are apparently little emphasized on Lake Michigan (4%) despite the similar industrial makeup of both basins.

Looking at the differences in problem type among Lakes, Erie and Michigan have very similar frequencies of occurrence for BOD, oil, heavy metals, etc. whereas Superior shows mainly problems associated with classical treatment, i.e., BOD and solids. Table VII shows a complete breakout of identified pollution problems by basin.

In the analysis of the enforcement status data, it must be remembered that the only clearcut data is the identification of litigation; the distinctions among state orders, various forms of stipulation and normal implementation schedules are not precise. In State and locally initiated court actions, Illinois has been more active than the others, with 14% of the sample of 29 Illinois dischargers subject to litigation or

TABLE VII - POLLUTION PROBLEMS BY BASIN

	Lake Superior # of plants - 36		Lake Michigan # of plants - 118		Lake Erie # of plants - 189	
	#	%	#	%	#	%
UNKN	0	0	0	0	3	2
NONE	0	0	5	4	27	14
AS	0	0	0	0	0	0
HG	0	0	0	0	-	-
PB	0	0	2	2	0	0
ZN	0	0	2	2	3	2
NI	0	0	1	.8	0	0
CR	0	0	2	2	4	2
CD	0	0	1	.8	0	0
FE	0	0	5	0	7	4
CU	0	0	1	.8	0	0
ME	0	0	6	5	13	7
FL	0	0	0	0	0	0
TH	0	0	0	0	-	-
CO	0	0	0	0	2	1
TO	1	3	0	0	4	2
SS	2	6	47	40	75	40
PN	1	3	2	2	7	4
BO	1	3	34	29	28	15
OI	0	0	24	20	31	17
AM	0	0	5	4	3	2
CN	0	0	10	8	13	7
CL	0	0	2	2	7	4
AC	0	0	6	5	26	14
EXCL	0	0	0	0	2	1
CAPY	1	3	0	0	2	1
NUTR	6	17	5	4	35	19
TREA	30	83	56	47	85	45
BACT	3	8	5	4	6	3
MUNI	23	58	49	41	45	24
MONI	0	0	99	84	32	17

recommended for litigation. Minnesota and Michigan appear to be reasonably active with 13% and 7% of dischargers involved in actual or planned State court actions, though these are very small sample sizes with only 2 court cases apiece. New York, Pennsylvania, Ohio, Indiana and Wisconsin are decidedly inactive with 0 to 3% of dischargers involved, though in the case of Wisconsin this is probably due to the efficacy of the Wisconsin Department of Natural Resources' formal order system. Federal prosecution is most active in exactly those States that seem least active. The Federal caseload is also substantially larger than the total State actions by about 3:1 for the present sample. Federal activity is greatest in Ohio (31% of dischargers), New York (16%) and Indiana (10%). In the remaining States, Wisconsin, Michigan, Minnesota, Illinois and Pennsylvania, Federal legal activity only affects 0 to 5% of dischargers.

All of the 43 Federal actions in the sample,with the exception of two 180 day notices, are Refuse Act prosecutions. About 25% of the actions are not beyond the stage of EPA recommendations to Justice. Almost all the remainder are in the courts now; therefore, little can be concluded on the success rate of Federal court actions in the Great Lakes. Of the 8 State cases in the sample that have been decided, 5 (63%) were won by the State.

Another common problem in enforcement is that of implementation schedule extensions (particularly for major polluters), either unilaterally granted by States or by Federal/State agreements (unfortunately, the distinction is not clear for most cases in the data file). The States in which these schedule slippages by means of stipulation or orders occur most frequently are Indiana (15% of cases), followed by Pennsylvania and Ohio at 10%. Minnesota and Wisconsin did not grant any extensions among the dischargers sampled.

Table VIII shows the distribution of all enforcement status categories by State and basin.

Perhaps the most interesting categorization of dischargers is in terms of compliance status, since completion of treatment construction or process modification, together with satisfactory operation, is the direct goal of enforcement. Table IX shows, in the first cell entries, the percentage of dischargers with satisfactorily completed construction by mid-1971 (though such construction may have been later than the date required by local standards). In analyzing this data, it should be kept in mind that compliance rates reflect both stringency of State or Federal requirements as well as geographical emphasis by authorities.

The second cell entry shows the percentage of satisfactory completions out of all dischargers known to have passed their

TABLE VIII - ENFORCEMENT STATUS BY BASIN AND STATE

	Lake Erie Ind. # plants - 23		Lake Erie Ohio # plants - 97		Lake Erie Pa. # plants - 21		Lake Erie Mich. # plants - 23		Lake Erie N. Y. # plants - 25	
	#	%	#	%	#	%	#	%	#	%
ORDS(X)	0	0	4	4	0	0	0	0	0	0
Avg.*			(5.5 yrs)							
ORDS	1	4	5	5	1	5	1	4	0	0
STPU(X)	3	13	1	1	1	5	0	0	1	4
Avg.*	(3 yrs)		(2 yrs)						(2 yrs)	
STPU	3	13	0	0	0	0	0	0	0	0
STPC(X)	0	0	0	0	0	0	0	0	0	0
Avg.*										
STPC	0	0	0	0	0	0	0	0	0	0
STPV(X)	0	0	4	4	1	5	0	0	0	0
Avg.*			(4.5 yrs)		(1 yr)					
STPV	0	0	0	0	0	0	2	8	0	0
MCT	0	0	1	1	0	0	0	0	0	0
SCTL	1	4	0	0	0	0	0	0	0	0
SCTW	0	0	0	0	0	0	2	8	0	0
SCTN	0	0	1	1	0	0	0	0	0	0
SCTR	0	0	1	1	0	0	0	0	0	0
180F	0	0	0	0	0	0	0	0	0	0
FCTLU	0	0	0	0	0	0	0	0	0	0
FCTLW	0	0	0	0	0	0	0	0	0	0
FCTLR	0	0	0	0	0	0	0	0	0	0
FCTWU	0	0	0	0	0	0	0	0	0	0
FCTWW	0	0	1	1	0	0	0	0	0	0
FCTWR	0	0	0	0	0	0	0	0	0	0
FCTNU	0	0	18	18	0	0	0	0	1	4
FCTNW	0	0	0	0	0	0	0	0	0	0
FCTNR	0	0	4	4	0	0	0	0	0	0
FCTRU	1	4	6	6	1	5	0	0	3	12
FCTRW	0	0	0	0	0	0	0	0	0	0
FCTRR	1	4	1	1	0	0	0	0	0	0
IMPL	15	65	57	59	5	24	19	82	17	68

* ( ) Average Schedule Slippage Shown For Each Category

TABLE VIII - ENFORCEMENT STATUS BY BASIN AND STATE (continued)

	Lake Michigan Ind. # plants - 45		Lake Michigan Ill. # plants - 29		Lake Michigan Wis. # plants - 39		Lake Michigan Mich. # plants - 5	
	#	%	#	%	#	%	#	%
ORDS(X)	1	2	0	0	0	0	0	0
Avg. *	(2 yrs)							
ORDS	0	0	0	0	24	61	0	0
STPU(X)	5	13	2	7	0	0	2	40
Avg. *	(2.5 yrs)		(5 yrs)				(1 yr)	
STPU	0	0	0	0	0	0	0	0
STPC(X)	0	0	1	3	0	0	0	0
Avg. *			(3 yrs)					
STPC	0	0	0	0	0	0	0	0
STPV(X)	0	0	0	0	0	0	0	0
Avg. *								
STPV	0	0	0	0	0	0	2	40
MCT__ __	0	0	4	14	0	0	0	0
SCTL __	1	2	0	0	0	0	0	0
SCTW __	0	0	1	3	1	3	0	0
SCTN __	0	0	2	7	0	0	0	0
SCTR __	0	0	0	0	1	3	0	0
180F	0	0	0	0	0	0	0	0
FCTLU	0	0	0	0	0	0	0	0
FCTLW	0	0	0	0	0	0	0	0
FCTLR	0	0	0	0	0	0	0	0
FCTWU	0	0	0	0	0	0	0	0
FCTWW	0	0	0	0	0	0	0	0
FCTWR	0	0	0	0	0	0	0	0
FCTNU	0	0	0	0	0	0	0	0
FCTNW	0	0	0	0	0	0	0	0
FCTNR	4	9	1	3	0	0	0	0
FCTRU	1	2	0	0	0	0	0	0
FCTRW	0	0	0	0	0	0	0	0
FCTRR	0	0	0	0	0	0	0	0
IMPL	36	80	20	69	14	36	1	20

TABLE VIII - ENFORCEMENT STATUS BY BASIN AND STATE (continued)

	Lake Superior Mich. # plants - 2		Lake Superior Minn. # plants - 15		Lake Superior Wis. # plants - 19	
	#	%	#	%	#	%
ORDS(X) Avg.*	0	0	0	0	0	0
ORDS	0	0	2	13	18	94
STPU(X) Avg.*	0	0	0	0	0	0
STPU	0	0	1	6	0	0
STPC(X) Avg.*	0	0	0	0	0	0
STPC	0	0	1	6	0	0
STPV(X) Avg.*	0	0	0	0	0	0
STPV	1	50	4	26	0	0
MCT___	0	0	0	0	0	0
SCTL__	0	0	1	6	0	0
SCTW__	0	0	1	6	0	0
SCTN__	0	0	0	0	0	0
SCTR__	0	0	0	0	0	0
180F	0	0	1	6	1	5
FCTLU	0	0	0	0	0	0
FCTLW	0	0	0	0	0	0
FCTLR	0	0	0	0	0	0
FCTWU	0	0	0	0	0	0
FCTWW	0	0	0	0	0	0
FCTWR	0	0	0	0	0	0
FCTNU	0	0	0	0	0	0
FCTNW	0	0	0	0	0	0
FCTNR	0	0	0	0	0	0
FCTRU	0	0	0	0	0	0
FCTRW	0	0	0	0	0	0
FCTRR	0	0	0	0	0	0
IMPL	1	50	6	40	1	5

final construction date requirement (as the date now stands, including stipulations allowing slippages). Table IX's third cell entry shows the percentage of unsatisfactory construction completions out of the total number of dischargers completing construction (where unsatisfactory completions may be due to excessively lax initial recommendations by enforcement personnel for meeting stream standards, changes in stream standards, or due to technically inadequate engineering or operation on the part of the discharger). Using the three sets of data, several interesting observations can be made:

a. Wide variations exist between States, even States within the same Enforcement Conference. The best records of satisfactory construction completion are held by Michigan (47%), the Lake Michigan area of Indiana (53%) and Illinois (61%). Even though Michigan is an active State and a substantial portion of its lake dischargers are covered by the 9 year old Calumet Conference, it has yet to achieve construction completion from half its Great Lakes dischargers.

The somewhat better Illinois and Indiana-Lake Michigan records (earliest Conference here is the 7 year old Calumet Conference) of 61% and 53% may be due to less stringent

TABLE IX - CONSTRUCTION COMPLIANCE STATUS

1st Cell Entry = % of all dischargers with satisfactory completion
2nd Cell Entry = % of compliances for dischargers required to finish construction by mid-1971
3rd Cell Entry = % of unsatisfactory completion for dischargers with construction completed

	Lake Erie	Lake Michigan	Lake Superior	ACROSS LAKES
Illinois	X	61 70 24	X	61 70 24
Indiana	22 51 37	53 69 24	X	43 63 27
Michigan	47 68 28	small sample	small sample	40 55 29
Minnesota	X	X	6 33 0	6 33 0
New York	20 31 0	X	X	20 31 0
Ohio	43 48 47	X	X	43 48 47
Pennsylvania	24 72 0	X	X	24 72 0
Wisconsin	X	25 86 7	26 72 16	26 76 16
ACROSS STATES	35 47 41	44 71 23	19 65 9	

initial requirements. Note that all three States run about 24% to 28% unsatisfactory construction completion and about 68% to 70% satisfactory completion for just those dischargers whose construction dates are due. Indiana's Lake Erie dischargers show poorer completion numbers on all counts with less than half as many completions as for Lake Michigan dischargers, though the first Erie Conference was 7 years ago. Ohio has a completion record slightly below these three but with a remarkably high 47% of unsatisfactory completions. Minnesota, New York, and Pennsylvania have approximately the same poor performance as Indiana, though New York has only 30% compliance from those required to have completed construction. Wisconsin, though known as a highly vigorous State in enforcement matters[1], appears to have placed little emphasis on Great Lakes dischargers until recently, since overall satisfactory completion is only 26%; however, it has significantly better compliance from those ordered to complete construction by mid-71 with an excellent 76% record and only 16% unsatisfactory completions.

---

[1]One hypothesis is that Wisconsin conservation forces have tended to emphasize preservation of relatively clean, less developed streams.

b. Comparing the overall satisfactory completion status of the Lakes, Michigan is actually slightly ahead of Erie, 44% vs. 35%, despite the fact that the first overall Michigan Conference occurred 3 years after the Erie Conference. This tends to support the view that construction achievements depend primarily on State enforcement vigor, since the Erie Conference clearly has a greater proportion of relatively inactive States. Lake Superior has half the completion percentage of Erie, due in part to the newness of the Conference, in part to the lack of emphasis by Wisconsin and, of course, the general inactivity of Minnesota.

Table X gives the complete detailed distribution of compliance status by State and basin. In the area of economic impact, only one important analysis is feasible at this stage of the data collection process, namely, an investigation of those specific dischargers who have moved or closed during the period covered by the Enforcement Conferences in question. Table XI exhibits the pertinent descriptors of the 16 plants that closed or moved out of the original sample of 343. Of these, only one is known to have moved due to the pressures of enforcement: the Revco Division of Revco

TABLE X - DISTRIBUTION OF COMPLIANCE STATUS BY STATE AND BASIN AS OF MID 1971

	Lake Erie Ind. # plants 23		Lake Erie Ohio # plants 97		Lake Erie Pa. # plants 21		Lake Erie Mich. # plants 23		Lake Erie N. Y. # plants 25	
	#	%	#	%	#	%	#	%	#	%
NCX(X)	0	0	2	2	0	0	0	0	0	0
Avg.*			(0 yr)							
MOV	0	0	0	0	0	0	0	0	0	0
CLO	1	4	1	1	0	0	0	0	1	4
NCO	0	0	0	0	0	0	0	0		
NCX	0	0	0	0	0	0	0	0	0	0
NCS(X)	0	0	4	4	2	9	1	4	3	12
Avg.*			(.25 yr)		(.5 yr)		(1 yr)		(.33 yr)	
NCS	0	0	0	0	0	0	0	0	1	4
NCU(X)	2	9	8	8	0	0	2	9	0	0
Avg.*	(0 yr)		(.8 yr)				(1 yr)			
NCU	1	4	30	30	0	0	2	9	0	0
NCC(X)	1	4	1	1	0	0	4	17	1	4
Avg.*	(1.5 yr)		(0 yr)				(2 yr)		(0 yr)	
NCC	1	4	3	3	0	0	0	0	6	24
NCR(X)	0	0	0	0	0	0	0	0	0	0
Avg.*										
NCP	0	0	0	0	1	5	0	0	0	0
CON	9	39	3	3	13	62	2	9	8	32
COU(X)	0	0	0	0	0	0	0	0	0	0
COU	0	0	1	1	0	0	0	0	0	0
COC(X)	2	9	21	22	1	5	1	4	0	0
Avg.*	(2 yr)		(1.7 yr)		(1 yr)		(1 yr)			
COC	3	13	20	21	4	19	10	43	5	20
COP(X)	1	4	1	1	0	0	0	0	0	0
Avg.*	(1 yr)		(1 yr)							
COP	1	4	1	1	0	0	0	0	1	4

*( ) Average number of years to complete from 6/71 or of schedule slippage for completed construction.

TABLE X - DISTRIBUTION OF COMPLIANCE STATUS
BY STATE AND BASIN AS OF MID 1971 (continued)

	Lake Superior Mich. # plants - 2		Lake Superior Minn. # plants - 15		Lake Superior Wis. # plants - 19	
	#	%	#	%	#	%
NCX(X) Avg. *						
MOV	0	0	0	0	0	0
CLO	0	0	0	0	1	5
NCO	0	0	1	6	0	0
NCX	0	0	0	0	0	0
NCS(X) Avg. *	0	0	0	0	0	0
NCS	0	0	0	0	0	0
NCU(X) Avg. *	0	0	0	0	0	0
NCU	0	0	0	0	1	5
NCC(X) Avg. *	0	0	1 (1 yr)	6	1 (1 yr)	5
NCC	0	0	0	0	0	0
NCR(X) Avg. *	0	0	0	0	0	0
NCP	0	0	0	0	0	0
CON	0	0	0	0	0	0
COU(X)	0	0	0	0	3	16
COU	0	0	1	6	1	5
COC(X) Avg. *	0	0	0	0	0	0
COC	1	50	1	6	5	26
COP(X) Avg. *	1 (3 yr)	50	31 (2 yr)	73	2 (0 yr)	10
COP						

TABLE X - DISTRIBUTION OF COMPLIANCE STATUS
BY STATE AND BASIN AS OF MID 1971 (continued)

	Lake Michigan Ind. # plants - 45		Lake Michigan Ill. # plants - 29		Lake Michigan Wis. # plants - 39		Lake Michigan Mich. # plants - 5	
	#	%	#	%	#	%	#	%
NCX(X) Avg. *								
MOV	0	0	0	0	0	0	0	0
CLO	0	0	0	0	0	0	0	0
NCO	0	0	0	0	0	0	0	0
NCX	0	0	0	0	0	0	0	0
NCS(X) Avg. *	2 (1 yr)	4	0	0	0	0	0	0
NCS	0	0	0	0	0	0	0	0
NCU(X) Avg. *	2 (2 yr)	4	2 (2.5 yr)	7	0	0	0	0
NCU	6	13	4	13	1	2	0	0
NCC(X) Avg. *	1 (1 yr)	2	1 (1 yr)	3	0	0	0	0
NCC	1	2	1	3	1	2	0	0
NCR(X) Avg. *	0	0	0	0	10 (1 yr)	25	0	0
NCP	0	0	1	3	1	2	2	40
CON	5	11	1	3	4	10	0	0
COU(X)	2	4	0	0	5	13	0	0
COU	2	4	0	0	1	2	0	0
COC(X) Avg. *	4 (1.2 yr)	9	4 (1 yr)	13	0	0	0	0
COC	20	44	14	48	10	25	0	0
COP(X) Avg. *	0	0	0	0	7 (1.8 yr)	18	0	0
COP	0	0	1	3	0	0	3	60

TABLE XI - INDUSTRIES WHICH CLOSED OR MOVED WHILE UNDER ENFORCEMENT

CLO = Closed
MOV = Moved
ND = No data
NA = Not applicable
UNCL = Record does not distinguish between compliance by construction and by ceasing discharge.

Name	E. I. duPont de Nemours	Auburn Tankage Co.
Town	Barksdale	Auburn
County	Bayfield	De Kalb
State	Wis.	Ind.
SIC		
Product		
No. of employees		
CLO/MOV, and date	CLO 3-71	CLO 69
First Eng. Conf., date	5-69	8-65
Constr. scheduled for completion on (date)	ND	ND
Was constr. complete before CLO/MOV?	ND	ND
Reasons for CLO/MOV, and source of info.	Marginal old plant; pollution a minor factor in closure. (EPA Wisconsin District Office, 12-71)	State official, via EPA Indiana District Office, states closure probably due to very small, marginal operation.

TABLE XI - continued

Bailey Wall Paper Co.	Detrex Chem. Industries, Chlorinated Solv. Div.	Pepsi-Cola Bot. Co.
Cleveland	Ashtabula	Wapakoneta
Cuyahoga	Ashtabula	Auglaize
Ohio	Ohio	Ohio
MOV 67	CLO sched. 12-71	MOV 68(?) to Lima
8-65	8-65	8-65
ND	2-67	1-68
ND	Yes	UNCL
Marginal plant, closed for that reason. (EPA Ohio District Office, 12-71)	Status of compliance report, 6-14-71, states "decrease in market for chlorinated solvents". (Confirmed by EPA Ohio District Office, 12-71)	Enforcement not a factor in decision to move. (EPA Ohio District Office, 12-71)

TABLE XI - continued

Revco Division, Revco Industries, Inc.	Growers & Packers Co-op	Applied Chemicals Corp. Solving Process Div.
Pandora	North Collins	Detroit
Putnam	Erie	Wayne
Ohio	N. Y.	Mich.
MOV 2-71 to Pa.	CLO 70?	CLO 5-68
8-65	8-65	3-62
8-68	6-70	4-68
ND	ND	ND
Federal/State enforcement was a significant factor in decision to move. (EPA Ohio District Office, 12-71)		

TABLE XI - continued

E. I. duPont de Nemours and Co. Industrial and Biochem. Div.	Chicago Hardware and Foundry	Berry Refining Co.
Ecorse	Chicago	Gary
Wayne	Cook	Lake
Mich.	Ill.	Ind.
CLO 7-68	CLO 7-69	CLO 67
3-62	3-68	3-65
4-67	7-72	12-68
Yes	Yes	UNCL
	Heavy metal problem was solved before plant closed. (EPA Illinois District Office, 12-71)	No information on relation between closure and enforcement. (EPA Illinois District Office, 12-71)

TABLE XI - continued

Calumet Nitrogen	Adolph Plating, Inc.	Continental Can Co.
Hammond	East Chicago	Elkhart
Lake	Lake	Elkhart
Ind.	Ind.	Ind.
CLO 8-68	CLO 12-69	CLO 2-71
3-65	3-68	3-68
12-68	12-68	12-69
ND	ND	ND
No information on relation between closure and enforcement. (EPA Illinois District Office, 12-71)	No information on relation between closure and enforcement. (EPA Illinois District Office, 12-71)	Temporary CLO: Status report, 7-16-71, states "Proposes connection to Elkhart when City expands plant for secondary treatment." State official, via EPA Indiana District Office, states closure probably due to labor problems.

TABLE XI - continued

Lehman Veal and Pultry Packers	Ft. Howard Paper Co. Sewage Treatment Plant
Wakarusa	Green Bay
Elkhart Ind.	Brown Wis.
CLO 5-70?	CLO 69
3-68	3-68
12-69	NA
ND	NA
State official, via EPA Indiana District Office, states closure probably due to difficultry with USDA or FDA regulations	Status of compliance report, 7-1-71, states "In 1969 connected to Green Bay S D, abandoned plant."

Industries apparently moved to Pennsylvania from Ohio in the expectation that it would encounter lower enforcement requirements with respect to its plating operation discharges. For five plants, the connection with enforcement actions is not yet known. The ten remaining plants appear to have moved or closed for other reasons. Several had actually completed required construction and then closed; the remainder were known by local EPA personnel to have marginal, inefficient plants independently of abatement costs and were caught by a declining market or had a labor problem.

With respect to discharge data for the modest number of plants where these are available it is felt that detailed analysis at this time would be imprudent, for the following reasons:

a. The Permit application is in no sense verified; the search of the Permit files showed a sizable fraction of applications to have glaring errors or omissions (possibly intentional). Comparison of Permit data against earlier reports show a number of major inconsistencies.

b. The most fundamental problem with the pre-enforcement discharge descriptions from Conference proceedings is that there is no identification as to

whether discharge loads represent increments added by the discharger (net loads) or whether they represent total (i.e., gross) discharge loads including pollutants present in the intake water -- the difference can amount to an order of magnitude or more for some of the dischargers in the present sample. EPA technical personnel interviewed say that "most" of the data is net load; they also say that most is industry reporting rather than EPA sampling.

c. The Permit application data give both average intake concentrations as well as gross discharge load, so that net load could be computed <u>if and only if</u> comparable flow proportional sampling was conducted for both intake and outfall.

d. A major problem in comparing and analyzing pre- and post-enforcement data is the inherent and the production-caused variability of discharge data. Several steel plant discharge reports show a <u>month-to-month</u> load variation range as high as 3:1. Although total variability is not well described in either the Permit or the Conference data, the Permit files do contain production rates. Unfortunately

the Conference data does not provide production rates for pre-enforcement conditions.

Because of the importance of quantitative discharge data, particularly with respect to assessing the effects of enforcement, a detailed effort involving examination of both State industrial monitoring reports (required by most of the Great Lakes States) as well as EPA sampling, where available, is recommended as a fruitful follow-on effort.

III. LEGAL TOOLS

1. Introduction

This report analyzes State and Federal water-pollution laws with particular reference to the Great Lakes States. It does not deal solely with the statutes, but with their application and with their modification under litigation as well.

Section 2 is devoted to the legal tools available to States and private citizens in antipollution suits. It concludes that the Great Lake States have long had effective legal tools, but have varied widely in the use they have made of them. The reluctance to use these tools is related to the political and economic interests that the State government is trying to foster. Where these interests have conflicted with pollution abatement, State laws have not been enforced vigorously.

Section 3 is entirely devoted to the Federal Water Pollution Control Act and the Refuse Act. It traces the evolution of the enforcement provisions of these Acts, and with their consequent use by Federal authorities. Amendments have significantly changed the Pollution Control Act, and the effect of these amendments on Federal pollution control (particularly in the Great Lakes) is discussed in detail. Litigation (especially in the Supreme Court) has been the greatest evolutionary force in the development of the Refuse Act from an obscure recodification of a small piece of navigation law into the most powerful Federal weapon for controlling water pollution; the most

important court cases are analyzed to show how this Act was expanded.

Literature references are given at the end of each section. Only the literature directly cited is referenced, and we have not attempted to include any but the most important references. A full list of the material we have examined will be made available upon request.

2. Legal Powers of States and Private Citizens

In his lengthy review of public water-quality regulation, Prof. Hines has summarized the principal finding of this section:

> The enforcement procedures [that will be used in the coming years by State pollution-control agencies] will not be new -- in most cases they will have been on the books for a long time -- the control agency simply has not used them. Enforcement is one aspect of state control programs where the typical local agency usually suffers from no deficiency in powers, yet enforcement has consistently been a major weakness of state pollution regulation. The non-enforcement problem is rooted in the essential unwillingness of the control agency to bring the full force of the enforcement machinery to bear on the polluter. In some states the record of enforcement is very good, yet no significant discrepancies can be observed between the laws of these states and the laws of states with a history of weak enforcement. The sole distinguishing feature seems to be the aggressiveness of the control agency officials responsible for enforcement. The philosophy of the state agency traditionally

> has been one of control through persuasion. The infrequency with which administrative clean-up orders have been issued and the rareness of enforcement litigation might be taken to mean that this policy of entreatment has succeeded. A cursory examination of the water in these states would reveal the fallacy of this assumption.
>
> [Emphasis supplied] (p. 227)

The Great Lakes States all have water-pollution laws and the power to enforce them (see the list of laws, regulations, and agencies in Section 2.2); while these laws have been frequently amended, some of these States have had rather comprehensive pollution-control laws for several decades. As we shall demonstrate below, however, there has been little relation between broad statutory authority and the pace of State enforcement action against polluters. The principal reason for this apparent anomaly is that the States have always had the power to prosecute polluters under their police powers, their duty to protect the health and promote the general welfare of their citizens, and their power to institute proceedings against public nuisances. In addition, private citizens have always had access to private remedies against polluters; these remedies, while admittedly restricted and often difficult to obtain in court because of the heavy burden of proof placed on the

plaintiff, are quite real, often very effective, and firmly rooted in common law and equity. These residual State powers and the powers of private citizens have been reviewed in some detail by Hines, and in great detail by Burke and by Smith.

What has been the pace of enforcement at the State level? How many administrative orders have been issued and how many court cases have been filed by State agencies? There has been no survey (to our knowledge, or to that of James McDonald, Head of Enforcement for EPA Region V) since April 1963, when the staff of the Senate Public Works Committee polled all the States, and summarized again the results of a similar poll taken by the House Public Works Committee in December 1959. The results of these polls are of great historical interest because they reveal a great deal about State powers and enforcement activities before the great flurry of legislative activity that began with the passage of the Federal Water Pollution Control Act of 1965. The Senate staff found that:

* 35 States and Puerto Rico have a water pollution control board with comprehensive powers for limiting discharges, enforcing abatement of existing pollution, and administering a discharge permit system. (p. 73)

* The other 15 States have legislative, and consequently administrative, difficulties. Please note that the Senate staff wrote "administrative" -- not "legal" -- difficulties. (p. 73)

* 42 States replied to the House questionnaire of 1959, with the following results:

Administrative orders issued

37 States have the authority to issue such orders.

8 States have issued none.

17 States have issued less than 50.

12 States have issued more than 50.

Court actions

17 States have brought no court actions.

5 States have brought one only.

10 States have brought 1 - 5.

6 States have brought 5 - 15.

3 States have brought more than 15.

1 State did not specify the number.

8 States did not reply to the questionnaire. (p. 76)

* "State statutes generally provide adequate enforcement powers to State water pollution control agencies and where States have been aggressive in the use of enforcement proceedings, these have been very successful.

However, most State agencies ... have not made extensive use of their enforcement powers, demonstrating instead of [sic] a marked preference for the employment of persuasive techniques." (p. 76)

* "All but 5 of the States are members of formal interstate agencies or informal interstate groups, and apply the established or agreed upon classifications and water quality standards to their interstate waters." (p. 79)

* Not all the Great Lakes States (as of 1963) had established water quality criteria or standards. Since the enactment of the Federal Water Quality Act of 1965 (P. L. 89-234), however, all States have established such criteria or standards. In 1963, the Great Lakes States reported as follows:

ILLINOIS had no specific statutory authority to establish standards or classifications, but as a member of ORSANCO it subscribed to ORSANCO's minimum effluent standards for discharges into the Illinois, Mississippi, Ohio, and Wabash Rivers.

INDIANA had a stream pollution control board empowered to determine qualities and properties of water that "indicate deleterious pollution". It had promulgated regulations for minimum effluent and stream standards.

MICHIGAN had no specific statutory authority except prohibition of injurious substances. No standards or classifications had been adopted by regulation or otherwise.

MINNESOTA had empowered its water pollution control commission to establish and alter pollution standards for any waters. However, no general standards or broad classification of waters had been established.

NEW YORK had empowered its water resources commission to make standards and to classify waters. A comprehensive system of water classification had been adopted.

OHIO had no specific statutory authority. Although no statewide standards had been established, water-quality objectives had been adopted for certain river basins.

PENNSYLVANIA had authorized its sanitary water board to adopt pollution control rules and regulations. 5 stream classifications had been adopted; effluent standards had been set for 5 industries; regulations for sub-surface disposal of wastes and for heated wastes had been established, and standards for radioactive wastes had been set.

WISCONSIN had no specific statutory authority, and no water-quality standards had been adopted. (pp. 80-82)

* The following list shows the lack of relationship between State enforcement activities and specific statutory authority (as of 1959):

ILLINOIS did not reply.

INDIANA (1944-1959) issued 170 administrative orders, brought 14 court cases, successfully concluded 149 actions, and had 6 cases pending.

MICHIGAN (1950-1959) issued 332 administrative orders, brought 53 court cases, successfully concluded 90 actions, and had 28 cases pending.

MINNESOTA (1945-1959) issued 3 administrative orders, brought 1 court case, successfully concluded 4 actions, and had no cases pending.

NEW YORK (1954-1959) issued 54 administrative orders, brought 3 court cases, successfully concluded 2 actions, and had 1 case pending.

OHIO (1953-1959) issued 53 administrative orders, brought 5 court cases, successfully concluded 43 actions, and had 7 cases pending.

PENNSYLVANIA (1937-1959) issued 1,766 administrative orders, did not specify how many court cases it had brought, successfully completed 1,263 actions, and had 477 cases pending.

WISCONSIN (1948-1959) issued 1,138 administrative orders, brought 4 court cases, successfully completed 696 actions, and had 442 cases pending. (p. 98)

Please note that Michigan, which did not have a comprehensive pollution-control statute, had brought nearly twice as many court cases as all the other Great Lakes States put together. Also note how many administrative orders had been issued by Wisconsin, which had no specific statutory authority either. New York, which had comprehensive

powers, shows up very poorly, and not because it had all that much less pollution to abate! It is significant to observe that while only 12 States had issued more than 50 administrative orders, only Minnesota of the Great Lakes States had issued less than 50, which suggests that most of the Lakes States were doing relatively more about water pollution than most other States.

Since the State pollution-control statutes bear little relation to State enforcement activities, we may well ask about the legal tools that were used by many of the "aggressive" State agencies. In addition to the pollution-control statutes (which varied widely in the authority they vested in pollution-control agencies), there were public and private nuisance laws, public-health statutes and regulations, and residual State and local police powers.

The many proponents of broad statutory authority for State pollution-control agencies have customarily underrated the power of these older tools, and have assumed a great deal about the performance of these State agencies; they almost always assume (without making their assumptions explicit) that these agencies will have adequate technical information and that they will pursue vigorous enforcement policies. As Prof. Hines had noted (paradoxically, because he has been one of the great proponents of broad authority for State water-pollution agencies), these assumptions often fly in the face of the facts. One of these difficult facts is that pollution laws and their enforcement

are much influenced by politics and economics; these influences vary with the interests (e. g. industrial development, conservation, fisheries, outdoor recreation and tourism) that the State is trying to promote.

Consequently, the older legal tools are once again being seriously examined. For example, the American Law Institute (at its May 1970 meeting) raised again the question of the law of nuisance, and the ensuing debate was exceedingly animated, involving such luminaries as Dean Prosser and Prof. Freund. As reported in 38 U. S. Law Week 2632, the arguments ranged from making administrative enforcement the exclusive remedy for pollution to broadening the law of public nuisance by eliminating two customary requirements of this body of law: (1) the requirement that the nuisance activity be a crime, and (2) the requirement that the plaintiff show special damage. These issues are still quite alive, because the Institute voted to restudy the sections on public nuisance. The following paragraphs are devoted to the most important of these issues, and deal with the laws of private and public nuisance in turn.

Private remedies against pollution are based on proof of injury to one's person or property, and legal action may be brought against the polluter who was responsible for the injury. The plaintiff may seek recompense for his damages, or an injunction against the polluting

activity, or both. These court actions are usually based on the law of private nuisance, and the court must decide whether the defendant's discharges are so unreasonable as to constitute a nuisance. In addition to persuading the jury that the pollution is unreasonable, the plaintiff must also show that he has suffered material harm that is different from that suffered by the general public -- in short, he must show special damage.

If the pollution is claimed to be a public nuisance, the State official who is responsible for water-pollution control is the proper plaintiff; as we have seen above, however, it is not always easy to persuade him to bring suit. Public nuisance laws are a clear expression of a State's (or a locality's) police powers, so that there is no question of standing to sue. In several other respects public and private nuisance are alike because courts apply some of the same substantive rules of law to both. Nevertheless, the two types of nuisance are legally quite different. Dean Prosser has succintly clarified these differences:

> "A private nuisance is narrowly restricted to the invasion of interests in the use or enjoyment of land. It is only a tort, and the remedy for it lies exclusively with the individual whose rights have been disturbed. A public nuisance is a species of catch-all low-grade criminal

> offense, consisting of an interference with the rights of the community at large, which may include anything from the blocking of a highway to a gaming-house or indecent exposure." (p. 997)

The intricacies of legal doctrine and the sizable body of common law have been analyzed at length by Burke, Hines, and Smith; the most significant legal materials have been reprinted in casebooks on water and environmental law, e.g. the standard references by Gray, Meyers and Tarlock, and Trelease. Prof. Sax has summarized the most important points:

> "Pollution is considered both an unreasonable use [of water] under riparian law and a nonbeneficial use in the appropriation states, and damages as well as injunctions are available as remedies. This does not mean, to be sure, that one has an obligation to let water flow down to other riparians or downstream appropriators wholly unsullied, but rather that the courts apply a traditional test of reasonable use, meaning some degradation is permissible, but that it had better not make the water substantially unusable for others. The common-law test has about as much, or

as little, certainty as does the concept of reasonable prudence in negligence law." (p. 442)

Although these remedies are less than certain, the State pollution-control agencies in the Great Lakes States (as elsewhere) have ample statutory authority to seek them, and to institute administrative proceedings as well. Furthermore, the States had the power to seek these remedies even before their pollution-control agencies were legislated into existence. While the details of legal procedure vary from State to State, their power to prosecute polluters has long been established. What has not been established with any constancy is their decision to use the tools at their disposal. In short, it is a question of policy and of will, not of law.

2.1 Literature References for Section 2

BURKE CR (Oct. 1949). Rights and remedies in the law of stream pollution. 35 Virginia Law Review 774.

HINES NW (Oct. 1966). Nor any drop to drink: Public regulation of water quality. I. State pollution control programs. 52 Iowa Law Review 186.

PROSSER WL (Oct. 1966). Private action for public nuisance. 52 Virginia Law Review 997.

SAX JL (1968). Water Law, Planning & Policy: Cases and Materials. Bobbs-Merrill, Indianapolis, etc.

SMITH WB (Jan. 1956). Statutory treatment of industrial stream pollution. 24 George Washington Law Review 302.

U.S. SENATE, COMMITTEE ON PUBLIC WORKS (June 1963). A study of pollution -- water; a staff report. Committee Print, 88th Congress, 1st Session. Library of Congress call number TD420. U45 (not serialized).

2.2 State Water Pollution Laws, Regulations, and Agencies in the Great Lakes Basin

ILLINOIS

Agency:
Illinois Environmental Protection Agency
State Office Building
400 S. Spring Street
Springfield, Illinois 62706

Laws etc.:

1. Environmental Protection Act (House Bill 3788, Laws of 1970).
2. Rules and Regulations Governing the Submission of Plan Documents (etc.); Adopted by the Illinois Sanitary Water Board on 19 Dec. 1951, amended 10 Dec. 1954 and 22 Jan. 1962. Cite as SWB-1.
3. Various SWB Standards relate to water quality criteria and objectives. These include SWB-6 (reports on waste treatment plants), -7 through -11 (water quality standards for interstate waters, including Lake Michigan), and -14 and -15 (certain other water quality standards).
4. Of less importance, SWB-5, regulations on cyanides and cyanogen compounds (effective since 2 Jan. 1965).

INDIANA

Agency:
Indiana Stream Pollution Control Board
1330 W. Michigan Street
Indianapolis, Indiana 46206

Laws etc.:

1. Indiana Stream Pollution Control Law (Chap. 214, Acts of 1943, as amended in 1954, 1957, and 1968).
2. Indiana Water Quality Standards
   - SPC 1R-2 18 Sept. 1970 (standards in mg/liter)
   - SPC 2 10 Jan. 1953 (on cyanides and cyanogens)
   - SPC 3 9 Dec. 1963 (coal fines and acid mine drainage)
   - SPC 4 through 6 (variously dated, on water quality criteria for Lake Michigan).

MICHIGAN

Agency:
Michigan Water Resources Commission, Department of Conservation
Lansing, Michigan

Laws etc.:
1. Michigan Water Pollution Control Law, Act 245, Public Acts of 1929 (amended variously 1949-1970).
2. Thomas J. Anderson, Gordon Rockwell Environmental Protection Act of 1970 (75th Legislature, Regular Session of 1970, Enrolled House Bill No. 3055, took effect on 1 Oct. 1970).
3. Michigan Watercraft Pollution Control Act (Act 167, Public Acts of 1970).
4. Water Quality Standards for Intrastate Waters (effective on 31 Jan. 1968).

MINNESOTA

Agency:
Minnesota Pollution Control Agency
717 Delaware Street, S. E.
Minneapolis, Minnesota 55440

Laws:
1. Water Pollution Control Act (Chap. 115, 1969 Statutes; includes the "Crystal Waters Act", Chap. 116, sec. 15).

NEW YORK

Agency:
N. Y. Department of Environmental Conservation (before 1 July 1970, Division of Pure Waters, State Department of Health)
Albany, New York

Laws etc.:
1. N. Y. Environmental Conservation Law (Chap. 140, Laws of N. Y., 1970).
2. Water Pollution Control Law (N. Y. Code, secs. 1200-1263(c))

3. N. Y. Classifications and Standards (Parts 700-703, Title 6, Official Compilation of Codes, Rules, and Regulations). [The Great Lakes are treated in Sec. 702.1.]
4. N. Y. Rules on Permits [for Wastewater Discharge] 10 NYCRR 73.

OHIO

Agency:
Water Pollution Control Board, State Department of Health
P. O. Box 118, 450 East Town Street
Columbus, Ohio 43216

Laws etc.:
1. Water Pollution Control Act (Sec. 6111.01 et seq., Revised Ohio Code).
2. Criteria of Stream Water Quality (amended 14 April 1970, adopted 10 Oct. 1967).
3. Board's Resolution on Discharge of Toxins (9 Feb. 1971).

PENNSYLVANIA

Agency:
Department of Environmental Resources, Harrisburg, Pennsylvania

Laws etc.:
1. Department of Environmental Resources Act (Act #275 of 1970, House Bill #2213, effective on 19 Jan. 1971).
2. Clean Streams Laws (Act of 22 June 1937, as amended in 1945, 1965, and 1970).
3. Sanitary Water Board Rules and Regulations, especially Article 301, Sec. 7 F (water quality criteria for the Lake Erie Basin). Other relevant articles include 100, 200, 300, 400, 500, 600, 700, 800, and 900.

WISCONSIN

Agency:
Division of Environmental Protection, Department of Natural Resources
P. O. Box 450
Madison, Wisconsin 53701

Laws etc.:

1. Water Pollution Control Law (Wisc. Code, Chap. 144.01 et seq., effective on 1 Sept. 1967).
2. Wisconsin Water Quality Standards (Interstate Standards became effective on 1 June 1967; Intrastate Standards took effect on 1 Sept. 1968).

3. Federal Statutory Powers

The two great grants of statutory authority to the Federal Government for water-pollution control are the Water Pollution Control Act of 1948 (P. L. 80-845, as amended in 1952, 1956, 1961, 1965, 1966, and 1970 by P. L. 82-579, P. L. 64-660, P. L. 87-88, P. L. 89-234, P. L. 89-573, and P. L. 91-224, codified at 33 U. S. C. 466 et seq.) and the so-called Refuse Act of 1899 (section 13 of the River and Harbor Act of 1899, 30 Stat. 1152, codified at 33 U. S. C. 407); and when one speaks of Federal enforcement, one almost always means the enforcement of these two laws. In the following pages we shall analyze the enforcement provisions of these laws and their evolution, noting that the Water Pollution Control Act (WPC Act, hereinafter) has developed and changed almost solely because of Congressional amendments, while the Refuse Act has been transformed by litigation from an obscure recodification of a small piece of navigation legislation (which was passed as a rider to an appropriations bill) to a powerful enforcement tool that one wit has called the McKinley Administration's Environmental Protection Act.

3.1 The Federal Water Pollution Control Act

The WPC Act was never designed for easy enforcement: Its enforcement provisions, even with all its amendments, forestall

Federal court action by a complicated array of time-consuming procedures and safeguards that require extensive Federal-State administrative coordination, letters of consent, public notices, hearings, and conferences. The Federal Government's authority to establish water-quality standards encompasses hundreds of thousands of stream miles, tens of thousands of square miles of lakes and reservoirs (including 61,000 square miles accounted for by the Great Lakes), and about 12,000 miles of general coastline bordering the 50 States[7]. Yet the enforcement actions number only in the dozens: forty-odd enforcement conferences, about a dozen 180-day notices, and just one court case. The difficulties in enforcement induced Frank J. Barry[1] (former Solicitor of the Department of the Interior) to publish a penetrating analysis of the enforcement provisions of the WPC Act; his evident frustration with these provisions can be seen in the subtitle he chose: "A Study of the Difficulty in Developing Effective Legislation". The obstacles to enforcement may be judged from the fact that as of 1963[5] there had been twenty conferences, four of which had progressed to the public hearing stage and one to trial; as of 1967[6] there had been 42 conferences, four public hearings, and one court case. It is not surprising that Mr. Barry found enforcement "a slow and painful process".

Mr. Barry's frustrated view is not the only authoritative one by any means. Prof. Hines[3] found that

"These minor dislocations in enforcement authority probably will not cause serious problems in implementing the water quality standards program for two reasons. First, it is not anticipated that the federal enforcement machinery will be extensively utilized in enforcing the standards of the 1965 Act ... [because] the state standards are designed to be self-executing. Therefore a deficiency in federal enforcement jurisdiction should not retard accomplishment of the objectives of the standards program. A second reason that the federal enforcement power is not crucial is that the standards are not intended to serve primarily enforcement purposes.... Their major value lies in their use in controlling and preventing pollution." (p. 590)

Prof. Hines goes on to point out that

"on its face the federal power appears narrower than the equivalent state authority. The particular industry prosecuted under the federal act has a much more favorable situation if the case reaches the courts because a federal court has the power to hear the case de novo if it chooses. In any

event, in reviewing the order of the federal agency, the court is expressly directed to give 'due consideration to the practicability and to the physical and economic feasibility of securing abatement of the pollution proved....' Because no federal enforcement case involving an industry has ever raised the issue it is uncertain what interpretation would be given to the 'economic feasibility' language, but it would appear that economics arguments would have a greater likelihood of success in a federal proceeding than in a state review." (p. 592)

While the WPC Act has never been particularly easy to enforce, its enforcement provisions have changed (often significantly) with each of the amendments to the 1948 Act. The original Act made subject to abatement pollution of interstate waters, which were defined as "all rivers, lakes, and other waters that flow across, or form a part of, State boundaries [Section 2(d)(1)]". Furthermore, this pollution must have endangered the health or welfare of persons in a State other than the State in which the discharges originated; this requirement greatly restricts the scope of Federal enforcement

authority because a great deal of interstate water pollution is only a danger to local residents. For example, the Government would never attempt to show in court that tailings from an ore-dressing plant in Minnesota had endangered the citizens of Michigan or Wisconsin. For this and other reasons, no suits were ever filed under the 1948 Act. Until the 1965 Act was passed, Federal authorities were required to prove not only that pollution had occurred, but also that someone in another State had actually been harmed by that pollution. In Barry's trenchant words:

> "It was not unlawful to discharge wastes into a river if no one used the water. Polluters could thus argue that if the quality of a river had been rendered so notoriously bad that no one dared use it, except to carry more filth, they were innocent of any violation of federal law." (p. 1112)

By a subtle change in the definition of interstate waters, the 1956 Act excluded from Federal enforcement all coastal waterways, including most of the Great Lakes. The 1956 Act defined these waters as "all rivers, lakes, and other waters that flow across, or form a part of, boundaries between two or more States [section 11(e), emphasis supplied] ". When the House Public Works Committee[4] re-examined this definition in 1961, it registered its displeasure in the following words:

"The present law... excludes from enforcement jurisdiction the greater part of the Great Lakes and their tributaries, the coastal waters of the Nation, many important coastal streams, ... and all rivers, lakes, and coastal waters of Alaska, Hawaii, and the Virgin Islands and Puerto Rico. The same situation exists as to international streams flowing across the northern and southern borders of the United States into our international neighbors. Examples are the Red River of the North in Minnesota, Lake Champlain in New York.... The greater part of the Hudson River is excluded, as are important reaches of the Tennessee, Columbia, Colorado, and Merrimack Rivers." (p. 8)

The altered definition was apparently the result of inadvertence, ignorance, or sly malice in the House, because neither the Administration nor the Senate had requested a change in the definition of "interstate waters".

The 1961 Act substantially restored the definition of "interstate waters", and expanded the enforcement coverage to include, for the first time, navigable waters, which can include intrastate waters which are not tributary to interstate waters; this expansion

allows the Federal Government, upon request of the Governor, to enter intrastate cases. Section 8(a) of this Act further enlarged Federal abatement authority by covering intrastate discharges which endanger health or welfare; formerly the Federal Government could not become involved unless the pollution endangered the citizens of another State. The provisions of Section 8(a), however, are of little consequence, because the Federal agencies cannot become involved unless the Governor has formally requested their aid: If the Governor has not proceeded against the polluter under the State's own police powers, the Governor probably has no "conviction to proceed at all, since police power measures can be more swift and effective than those available under federal law."[1]

The 1965 Act marked another expansion of Federal powers. In addition to providing for water-quality standards, the Act empowers the Federal Government to abate pollution that violates the quality standards for interstate -- but not other navigable -- waters. For the first time, this Act gives a mandate to Federal authorities to institute proceedings against pollution other than that which endangers public health and welfare: It allows the Government to proceed when it "finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce". This is an exceedingly important precedent, because it is the first

important instance in the evolution of the WPC Act where the Government's Constitutional authority is derived from the commerce clause, rather than from the general power to tax and spend for the general welfare; this additional Constitutional basis may have significant consequences for pleadings in the Supreme Court.

The 1966 Act for the first time allows enforcement to be instituted when it appears to the Secretary of State that pollution originating in the U.S. is endangering citizens of another country (Section 206). With respect to Canada's border on the Great Lakes, it is not clear how this provision will realistically alter the broad commitment we made to Canada early in this century; the treaty that established the International Joint Commission (36 Stat. 2450) specified that boundary waters "shall not be polluted on either side to the injury of health or property on the other." Erichsen-Brown[2] has argued that

> "It is difficult to conceive of either government presenting a claim to the other in respect of an 'across the border pollution' within the Great Lakes.... It might well be suggested that the Canadian government would have greater grounds for espousing claims of Canadians against the U.S. in respect of the pollution of

a body of water such as Lake Erie, as the pollution on the American side is greater, but this is a distinction without a difference, because the problem of establishing a causal connection between specific acts of pollution and particular damage sustained is really beyond the capacity of experts to determine. They are most likely to assert negatively that a connection has not been established." (pp. 68-69)

Until the 1966 Act, the WPC Acts had not specified how the Government was to obtain specific evidence of pollution. Section 208(b) of this Act authorized the Government to require an alleged polluter to file a report, based on existing data, about the character, kind, and quantity of his discharges and about his pollution-control measures. This provision has now become superfluous because the permit applications that are now required under the Refuse Act already supply all this information and more.

The 1970 Act will not be discussed here. This Act deals largely with oil and hazardous materials, and greatly expands enforcement activities involving these kinds of pollution. The civil and criminal penalties prescribed by this Act merit much fuller treatment than we can give them in this brief review.

3.2 References for Section 3.1

1. BARRY FJ (1967). The evolution of the enforcement provisions of the Federal Water Pollution Control Act: A study of the difficulty in developing effective legislation. 68 Michigan Law Review 1103.

2. ERICHSEN-BROWN JB (1967). Legal implications of boundary water pollution. 17 Buffalo Law Review 65.

3. HINES NW (1968). Controlling industrial pollution: Color the problem green. 9 Boston College Industrial and Commercial Law Review 553.

4. U.S. HOUSE OF REPRESENTATIVES, COMMITTEE ON PUBLIC WORKS (1961). House Report No. 306, 87th Congress, 1st Session.

5. U.S. SENATE, COMMITTEE ON PUBLIC WORKS (1963). A study of pollution -- water; a staff report. Committee Print, 88th Congress, 1st Session. Library of Congress call number TD 420. U45 (not serialized).

6. U.S. SENATE, COMMITTEE ON PUBLIC WORKS (1967). Water Pollution -- 1967. Part 2.

7. U.S. SENATE, COMMITTEE ON PUBLIC WORKS (1970). Water Pollution -- 1970. Additional testimony of Murray Stein, Part 1, p. 296.

3.3 The Refuse Act

The architect of the Refuse Act, Judge G. W. Koonce (who served as legal counsel to the Corps of Engineers for sixty years), wrote the Act as a compilation of all the general laws that had been enacted from time to time for the maintenance, protection, and preservation of the navigable waters of the United States. General Groves[1] of the Corps recently testified before the House Committee on Public Works that the Judge "appears to have believed that his compilation involved only slight changes in existing law made so as to remove ambiguities." As we all know now, it is a good deal more than that, and no one would be more surprised than the Judge himself. In a lecture[2] he delivered in 1926, Judge Koonce stated that this Act

> "was intended to be, and is, an assertion of police power to protect from physical injury those highways of commerce in which the Federal Government has dominion and propriety, and within its comprehensive provisions are embraced all forms and varieties of physical obstructions.... Under section 10, as well as section 13 [of the Act] relating to the discharge of [sic; "or" is meant] deposit of refuse matter in navigable waters, the commission

> of any of the acts forbidden, not their results, constitute [sic] the offense, and the commission subjects the offending party to the prescribed penalty, regardless of whether or not there is any actual injury to navigation." (pp. 6-7, 10)

This attempt to facilitate enforcement by removing ambiguity succeeded so admirably that the Refuse Act is (thanks to two landmark decisions by the Supreme Court) the most comprehensive antipollution statute on the books. Now codified at 33 U.S.C. 407, the key provision of this Act makes it unlawful to discharge (or allow to be discharged) or deposit (or allow to be deposited) "any refuse matter of any kind or description whatever other than that flowing from streets and sewers and passing therefrom in a liquid state" into any navigable water or any tributary of any navigable water; it is also unlawful to deposit (etc.) material of any kind on the bank of any navigable water (or tributary) where said material may be washed into the water, thereby obstructing or impeding navigation. The Act provided criminal sanctions for "commission of any of the acts forbidden", and authorized the Corps to administer a permit program for controlling such deposits or discharges. The Supreme Court converted this obscure Act into a powerful antipollution tool by:

* Agreeing with Judge Koonce that discharges and deposits are forbidden, whether or not they affect navigation;

* Defining "refuse" as anything but sewage, no matter how valuable the discharged matter may be; many lawyers are now of the opinion that if the bed of the Potomac were to be paved with gold ingots, the paving contractor could be prosecuted under the Refuse Act for strewing the riverbed with "refuse";

* Providing, in addition to the criminal sanctions called for in the Act, injunctive relief against prohibited discharges.

The growth of Federal enforcement under the Refuse Act has been analyzed at length by Tripp and Hall[3].

At first, the Refuse Act was applied only to solid matter that would reduce the navigable capacity of a waterway. With the passage of the Oil Pollution Control Act of 1924 (P. L. 68-238), the interpretation of the Refuse Act was broadened to complement the new legislation: The Oil Pollution Act was used for spills from ships into tidal waters, while the Refuse Act was applied to oil

discharges into fresh waters or from shore facilities. Since oil slicks can create a serious fire hazard for ships, this expansion of the Refuse Act was not inconsistent with its original purpose.

The next great expansion of the Act was the Supreme Court's decision in United States v. Republic Steel (362 U.S. 482, 1960). The defendants had been discharging flue dust, mill scale, etc. in water suspension into the Calumet River, near Chicago. The solids precipitated from suspension, forming shoals on the riverbed, which had to be periodically dredged. The steel company had no permit for this discharge. The Corps prevailed on the Justice Department to file suit (over the Department's objections that it had more important things to do than prosecute under an obscure 1899 Act). The Government requested an order compelling the defendants to obtain a discharge permit and to restore the depth of the channel by removing portions of the existing deposits. The district court's injunction was reversed by the court of appeals, and the case finally reached the Supreme Court, which upheld the district court's injunction in a five-four decision.

Although the Refuse Act provides civil remedies only for obstructions to navigation that are caused by man-made structures,

the Court held that these shoals of "industrial solids" could also be enjoined. The language of Justice Douglas' majority opinion indicates by inference that civil remedies were envisioned for other portions of the Refuse Act:

> "Congress has legislated and made its purpose clear; it has provided enough federal law in section 10 (33 U.S.C. 403) from which appropriate remedies may be fashioned even though they rest on inferences. Otherwise we impute to Congress a futility inconsistent with the great design of this legislation." (p. 492)

In 1966, the Supreme Court was asked to interpret the scope of the Refuse Act in the case of United States v. Standard Oil Co. (384 U.S. 224). The U.S. District Court had dismissed the indictment against Esso because it interpreted the statutory phrase "refuse matter" as excluding commercially valuable aviation fuel. It was in this opinion that the Court defined "refuse matter" as (effectively) everything, no matter how valuable, but sewage. This was also the first case in which the question of navigation obstruction did not figure at all. On the basis of the Republic Steel and Esso decisions, what had originally been a criminal statute became a general-purpose

antipollution law that could be used to stop discharges into waterways, without the need to show that navigation had been adversely affected. In its present form, the Refuse Act does not require any proof of damages, any violation of water-quality criteria, or any effect on public health or welfare. The "prohibited acts" are offenses in and of themselves, and may be halted by court order.

In recent years, the Act has been used to enjoin thermal effluents from powerplants and industrial discharges of mercury. At the same time, the permit system called for in the Act has been expanded, so that anyone making or proposing to make discharges into navigable waters now requires a permit from the Corps. The enlarged permit program was implemented in December, 1970, by Executive Order 11574, and the Corps must now defer to the Environmental Protection Agency in all considerations of water quality. The implementation of this enlarged permit program in conjunction with the WPC Act has ushered in a new day in Federal water-pollution control.

3.4 References for Section 3.3

1. GROVES RH (1971). Unpublished statement before the Committee on Public Works, House of Representatives, 3 June 1971. General Groves' testimony was kindly supplied to us in manuscript by the Corps of Engineers. To be published.

2. KOONCE GW (1926). Federal laws affecting river and harbor works. Unpublished lecture to the Company Officers Class, The Engineer School, Fort Humphreys, Virginia, 23 April 1926. A manuscript copy of this lecture was kindly supplied by the Corps of Engineers. General Groves (see reference #1) has appended this lecture to his Congressional testimony. To be published.

3. TRIPP JTB & HALL RM (1970). Federal enforcement under the Refuse Act of 1899. 35 Albany Law Review 60.